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# GOVERNMENT GAZETTE

## BOLETIM OFICIAL

### GOVERNMENT OF GOA, DAMAN AND DIU

Special Department

#### Notification

OSD/R/RVS/42/67

In exercise of the powers conferred by the proviso to article 309 of the Constitution, read with the Government of India, Ministry of External Affairs letter No. F.7(11)/62-Goa dated the 25th July 1963, the Administrator of Goa, Daman and Diu, is pleased to make the following rules relating to the recruitment rules for the post of Plant Supervisor in the Directorate of Animal Husbandry and Veterinary Services under the Government of Goa, Daman and Diu.

1. **Short title.** — These rules may be called Goa Government, Directorate of Animal Husbandry and Veterinary Services, Plant Supervisor (Class III non-ministerial, non-gazetted post) Recruitment Rules, 1969.

2. **Application.** — These rules shall apply to the posts specified in column 1 of the Schedule to these rules.

3. **Number, classification and scale of pay.** — The number of posts, classification of the said posts and the scales of pay attached thereto shall be as specified in columns 2 to 4 of the said Schedule.

4. **Method of recruitment, age limit and other qualifications.** — The method of recruitment of the said posts, age limit, qualifications and other matters

connected therewith shall be as specified in columns 5 to 13 of the aforesaid Schedule.

Provided that,

- the maximum age limit specified in the Schedule in respect of direct recruitment may be relaxed in the case of candidates belonging to the Scheduled Castes and Scheduled Tribes and other special categories in accordance with the orders issued by the Government from time to time; and
- no male candidate, who has more than one wife living and no female candidate, who has married a person having already a wife living, shall be eligible for appointment, unless the Government, after having been satisfied that there are special grounds for doing so, exempts any such candidate from the operation of this rule.

5. These rules will come into effect from the date of the Notification and will relate to appointments to the various posts made on or after this date. An appointment made prior to this date through a duly constituted Staff Selection Board/Departmental Promotion Committee will be deemed to be a regular appointment, notwithstanding any provisions contained in these rules, and the probation period in that case will extend to six months only from the date of this notification.

By order and in the name of the Administrator of Goa, Daman and Diu.

D. V. Sawant, Under Secretary (Appointments).

Panaji, 15th January, 1969.

25th Pausa, 1890.

## SCHEDULE

| Name of the post | No. of posts | Classification                            | Scale of Pay               | Whether Selection Post or non-Selection Post | Age for direct recruits | Educational and other qualifications required for direct recruits  | Whether age and educational qualifications prescribed for the direct recruits will apply in the case of promotees | Period of probation, if any | Method of recruitment whether by direct recruitment or by promotion or by deputation/transfer, and percentage of the vacancies to be filled by various methods | In case of recruitment, by promotion/deputation/transfer, grades from which promotion/deputation/transfer to be made | If a DPC exists, what is to be considered in its composition making recruitment | Circumstances in which U.P.S.C. is to be consulted in making recruitment |
|------------------|--------------|---|----------------------------|--|-------------------------|--|---|-----------------------------|--|--|---|--|
|                  |              |   |                            |  |                         |  |   |                             |  |  |   |  |
| 1                | 2            | 3   | 4                          | 5  | 6                       | 7  | 8   | 9                           | 10   | 11   | 12  | 13   |
| Plant Supervisor | One          | Class III (Non-Gazetted Non-Ministerial). | Rs. 180-10-290-EEB-15-380. | Selection                                    | 30 years and below      | 1) Should have mechanical engineering diploma of a recognised institution with minimum experience of 3 years in repairs and overhaul of pasteurisers, refrigeration equipment, dairy equipment, and boiler.<br>or<br>2) Should have passed mechanic course of a recognised institution having more than 5 years experience in repairs and overhaul of dairy machinery, pasteurizers, refrigeration equipment and boiler. | N.A.  | Two years.                  | Direct recruitment.  | N.A.   | N.A.  | As required under the rules.   |

## Notification

OSD/RRVS/11/68-Vol. II

In exercise of the powers conferred by the proviso to article 309 of the Constitution, read with the Government of India, Ministry of External Affairs letter no. F.7(11)/62-Goa dated the 25th July 1963, the Administrator of Goa, Daman and Diu is pleased to make the following rules relating to the Class III (Non-ministerial, non-gazetted) post in the Department of Health Services, under the Government of Goa, Daman and Diu.

1. **Short title.**—These rules may be called Goa Government, (Directorate of Health Services) Class III (non-ministerial, non-gazetted) post Recruitment Rules, 1968.

2. **Application.**—These rules shall apply to the posts specified in column 1 of the Schedule to these rules.

3. **Number, classification and scale of pay.**—The number of posts, classification of the said posts and the scales of pay attached thereto shall be as specified in columns 2 to 4 of the said Schedule.

4. **Method of recruitment, age limit and other qualifications.**—The method of recruitment of the said posts, age limit, qualifications and other matters connected therewith shall be as specified in columns 5 to 13 of the aforesaid Schedule.

Provided that,

- the maximum age limit specified in the Schedule in respect of direct recruitment may be relaxed in the case of candidates belonging to the Scheduled Castes and Scheduled Tribes and other special categories in accordance with the orders issued by the Government from time to time; and
- no male candidate, who has more than one wife living and no female candidate, who has married a person having already a wife living, shall be eligible for appointment, unless the Government, after having been satisfied that there are special grounds for doing so, exempts any such candidate from the operation of this rule.

5. These rules will come into effect from the date of the Notification and will relate to appointments to the various posts made on or after this date.

B. Ram,

For Chief Secretary

Panaji, 7th January, 1969.

17th Pausa, 1890.

## SCHEDULE

| Name of the post  | No. of posts | Classification                            | Scale of Pay   | Whether Selection Post or non-Selection Post | Age for direct recruits | Educational and other qualifications required for direct recruits | Whether age and educational qualifications prescribed for the direct recruitments will apply in the case of promotees | Period of probation, if any | Method of recruitment whether by direct recruitment or by promotion/transfer, and percentage of the vacancies to be filled by various methods | In case of recruitment, by promotion/deputation/transfer, grades from which promotion/deputation/transfer to be made | If a DPC exists, what is to be considered in making recruitment | Circumstances in which U. P. S. C. is to be consulted in making recruitment |
|---|--------------|---|----------------|--|-------------------------|---|---|-----------------------------|---|--|---|---|
| 1   | 2            | 3   | 4              | 5  | 6                       | 7   | 8   | 9                           | 10  | 11   | 12  | 13  |
| 1. Biochemist   | 1            | Class III (Non-ministerial, Non-gazetted) | Rs. 350-15-425 | Selection                                    | 30 years or below       | M.Sc. Degree in Biochemistry of a recognised University.          | N. A.   | Two years                   | By direct recruitment   | N. A.  | N. A.   | As required under the rules.  |
| <i>Desirable:</i><br>Experience in Biochemical work in Biochemistry Department of a Medical College or in a Laboratory during Medical Research. |              |   |                |  |                         |   |   |                             |   |  |   |   |

Desirable:

Experience in Bio-chemical work in Bio-chemistry Department of a Medical College or in a Laboratory during Medical Research.

## Notification

2-70-68-SPL

The following Notification no. 2/6/65-AIS(IV) dated 19th December, 1968 issued by the Government of India, Ministry of Home Affairs is hereby published for information.

D. V. Sawant, Under Secretary (Appointments).

Panaji, 10th February, 1969.

21st Magha, 1890.

## GOVERNMENT OF INDIA

## MINISTRY OF HOME AFFAIRS

New Delhi-1, the 19th December 1968  
28th Agrahayana 1890

## Notification

2/6/65-AIS (IV)

In pursuance of rule 8 of the Indian Forest Service (Probation) Rules, 1968, the Central Government, in consultation with the State Governments and the Union Public Service Commission, hereby makes the following regulations, namely:—

1. **Short title and commencement.**— (1) These regulations may be called the Indian Forest Service (Probationers' Final Examination) Regulations, 1968.

(2) They shall be deemed to have come into force on 1st April, 1968.

2. **Definitions.**— (1) In these regulations, unless the context otherwise requires, "Schedule" means a Schedule appended to these regulations.

(2) All other words and expressions used in these regulations and not defined shall have the meanings respectively assigned to them in the Indian Forest Service (Probation) Rules, 1968.

3. **Final Examination.**— (1) Every probationer shall, during and at or about the end of the period of training at the Institute, appear at the Final Examination comprising;

- (i) written and practical examinations,
- (ii) exercises, and
- (iii) qualifying tests.

(2) The written and practical examinations shall be held as follows:—

- (i) First year Examination at or about the end of the first year of training at the Institute, and
- (ii) Second year Examination at or about the end of the second year of training at the Institute.

(3) Exercises in field work shall be held during the course of training at the Institute and during tours undertaken according to a phased programme.

(4) The Final Examination shall be conducted by

the President in the manner laid down in these regulations.

(5) The dates on which and the places at which the various examinations and tests shall be held shall be fixed by the Central Government in consultation with the President.

**4. Subjects and Syllabus for (A) Written and Practical Examinations and (B) Exercises.**—The subjects for written and practical examinations and exercises shall be as mentioned below—

**(A) Written and Practical Examinations:**

The subjects for these examinations and the maximum marks allotted to each of them shall be as follows:—

| Subject   | Paper     | Examinations in 1st year | Examinations in 2nd year | Total      |
|---|-----------|--------------------------|--------------------------|------------|
| (1) <i>Silviculture:</i>                                    | I         | 25                       | 30                       | 140        |
|   | II        | 25                       | 30                       |            |
|   | Viva-Voce | -                        | 30                       |            |
| (2) <i>Land Management &amp; Soil Conservation:</i>         |           | 30                       | -                        | 30         |
| (3) <i>Forest Mensuration:</i>                              | I         | 25                       | -                        | 50         |
|   | II        | 25                       | -                        |            |
| (4) <i>Forest Utilisation:</i>                              |           |                          |                          |            |
| (i) General Utilisation ...                                 | I         | 30                       | -                        | 110        |
| (ii) Forest Products other than timber ...                  | II        | 20                       | -                        |            |
| (iii) Forest Products (Processed) ...                       | III       | -                        | 40                       |            |
| (iv) Wood Technology Theory                                 | IV        | -                        | 10                       |            |
| (v) Wood Technology Practical                               | V         | -                        | 10                       |            |
| (5) <i>Geology:</i>   |           |                          |                          |            |
| (i) Geology Theory ...                                      | I         | 10                       | -                        | 15         |
| (ii) Geology Practical ...                                  | II        | 5                        | -                        |            |
| (6) <i>Soil Science:</i>                                    |           |                          |                          |            |
| (i) Soil Science Theory ...                                 | I         | 15                       | -                        | 25         |
| (ii) Soil Science Practical ...                             | II        | 10                       | -                        |            |
| (7) <i>Forest Management:</i>                               |           |                          |                          |            |
| (i) Forest Management, Working Plans and Forest Finance ... | I         | -                        | 30                       | 40         |
| (ii) Forest Protection ...                                  | II        | -                        | 10                       |            |
| (8) <i>Wild Life Management:</i>                            |           | -                        | 15                       | 15         |
| (9) <i>Forest Policy and Law:</i>                           |           | -                        | 20                       | 20         |
| (10) <i>Forest Botany:</i>                                  |           |                          |                          |            |
| (i) Botany Theory ...                                       | I         | 30                       | 20                       | 95         |
| (ii) Botany Practical ...                                   | II        | 25                       | 20                       |            |
| (11) <i>Mycology &amp; Forest Pathology:</i>                |           |                          |                          |            |
| (i) Mycology Theory ...                                     | I         | -                        | 10                       | 15         |
| (ii) Mycology Practical ...                                 | II        | -                        | 5                        |            |
| (12) <i>Forest Zoology &amp; Entomology:</i>                |           |                          |                          |            |
| (i) Zoology Theory ...                                      | I         | 15                       | -                        | 50         |
| (ii) Zoology Practical ...                                  | II        | 10                       | -                        |            |
| (iii) Forest Entomology Theory                              | III       | -                        | 15                       |            |
| (iv) Forest Entomology Practical ...                        | IV        | -                        | 10                       |            |
| (13) <i>Forest Engineering:</i>                             |           | -                        | 25                       | 25         |
| (14) <i>Forest Surveying:</i>                               |           |                          |                          |            |
| (i) Survey Theory ...                                       | I         | 35                       | -                        | 55         |
| (ii) Survey Practical ...                                   | II        | 20                       | -                        |            |
| <b>Total</b>  |           | <b>380</b>               | <b>330</b>               | <b>710</b> |

**(B) Exercises:**

The subjects of these exercises and the maximum marks allotted to each of them shall be as follows:—

| Subject  | Exercises during the course of the 1st year | Exercises during the course of the 2nd year | Total       |
|--|---|---|-------------|
| (1) Study and practical work in tours (extending to all important forest types of India) ... | 90  | 60  | 150         |
| (2) Botanical collections during each tour ...   | 12  | 8   | 20          |
| (3) Entomological collections during the course ...  | —   | 10  | 10          |
| (4) Engineering & Surveying plates   | 7   | 8   | 15          |
| (5) Working Plan exercise ...  | —   | 60  | 60          |
| (6) Field Engineering course with the Army ...   | —   | 5   | 5           |
| (7) Forest road alignment Exercise   | —   | 5   | 5           |
| (8) Dissertation (thesis) on a selected subject ...  | —   | 25  | 25          |
| <b>Total</b>   | <b>109</b>                                  | <b>181</b>                                  | <b>290</b>  |
| <b>Grand Total for Examinations &amp; Exercises</b>  | <b>489</b>                                  | <b>511</b>                                  | <b>1000</b> |

The syllabus for the written and practical examinations and exercises shall be as specified in Part I of the First Schedule.

**5. Qualifying tests.**—(1) Qualifying tests in the following subjects shall be conducted by the President, namely:—

- (i) first aid and ambulance drill,
- (ii) weapon training,
- (iii) riding,
- (iv) a regional language,
- (v) Hindi, except for candidates who are examined in Hindi as a regional language under clause (iv),
- (vi) Motor Mechanics,
- (vii) Swimming.

The syllabus for the qualifying tests shall be as specified in Part II of the First Schedule.

(2) Every probationer shall be examined in the regional language or one of the regional languages shown in column 2 of the Second Schedule against the State to which he is allotted. Where more than one regional language is shown against a State, the President shall ascertain whether the probationer is already familiar with any of them and thereafter decide in consultation with the State Government in which one of the regional languages the probationer shall be examined.

**6. Prescribing minimum pass marks for examinations and standards of qualifying tests.**—Every probationer shall be required to obtain such minimum number of marks in each subject at the written and practical examinations and the exercises under regulation 4, as the Central Government may prescribe, and to pass the qualifying tests conducted by the President under regulation 5 by such standards as he may prescribe.

M. R. BHARDWAJ

Under Secretary to the Govt. of India

## FIRST SCHEDULE

(See regulations 4 and 5)

## Part I

## Syllabus for the Indian Forest Service Probationers' final examination

## I—Written and practical examinations in First Year

## (1) Silviculture

## (a) Paper I

General Silviculture, introduction, definitions, scope, foundations and practice of forestry, general features of vegetation of the world—forest, scrub, grass lands and desert, early history of Indian forests, extent of forests and other statistical data.

Factors of locality—as affecting vegetation, climatic factors including temperature, rainfall, wind, dew, atmospheric humidity, evaporation, classification of climates in India, edaphic factors including general principles of soil formation, soil genesis and artificial treatment of the soil—topographic factors including configuration, slope, aspects, altitude and surface condition, biological factors, competition, plant succession and development, interference by man, soil flora and fauna, wild animals.

Forest Influences—Micro-climatic conditions under vegetation.

Site—Definition, site quality and its maintenance.

Form and growth of trees and crops—

Tree morphology; Form; crown; stem, root system, development, size, age, reproduction of trees, inheritance of parental characters.

Crop morphology: Crop form, crop height, crop bole form; crop diameter, crop volume, crop growth, root and crop competition, reduction in number of stems with age, diameter and height increment of crop, form and growth of bamboos.

Trees and Crop Physiology—Life process of trees, water relations, light relations, temperature relations, food synthesis, absorption of minerals, Nitrogen and Carbon cycles, orientation and movement.

Principles of Ecology—Origin, succession and development of forest growth, climax, different types of climaxes.

Structure of vegetation—Forest composition and its distribution, Forest types of India.

## (b) Paper II

Natural regeneration—Role of overwood, undergrowth, burning, natural regeneration by seed and by vegetative methods, cultural operations, weeding and cleaning.

Artificial regeneration—Objects, organisation of plantation works, seed supply, seed stores and pre-treatment, methods, time of sowing and planting, nursery works, fencing, labour supply, underplanting, cover crops, nurse crops.

Afforestation—Cultivated land, grass land, irrigated plantations, denuded hills, ravine land, land-slips, saline and alkaline soils, swampy sites, sand-dunes-inland and coastal.

Tending—Weeding, cleaning, climber cutting, thinning, improvement felling, type of thinnings, mathematical check on thinnings, results from thinning pruning etc.

## (2) Land Management &amp; Soil Conservation

Concept of soil conservation, erosion agencies, water and wind, process and types of erosion, factors affecting erosion, land problems in India—agriculture lands, forest lands and grass land; principles soil conservation, measures for conservation in different land uses; farm forestry and forest extension; management of agricultural lands; regulation and improvement of grazing and live stock problems, small soil conservation engineering measures, research and investigation, water-shed planning and management.

## (3) Forest Mensuration

## (a) Paper I

Introduction—Definition, scope and objects.

Measurement of trees—Diameter and girth, conversion factors, bark thickness, height, instruments for diameter and height measurements, metzger's theory, form point, form factor, form quotients, form height, taper in trees, sources and magnitude of error in various measurements and formulae, volume measurements, formulae for calculations, timber measurement tables and their use, solid volume and stacked volume, conversion factors; determination of age

of trees, stump and stem analysis, determination of increment, diameter increment, height increment, basal increment, volume increment.

Statistics in relation to sampling—Averages—arithmatic average, median, mode, measure of dispersion and the normal curve of error, standard deviation, standard error, sampling; transformation of curves into straight lines.

## (b) Paper II

Enumeration of growing stock—partial, total.

Measurement of crop—Age, diameter, height, density, volume; preparation and use of volume tables, yield-tables, stand-tables, money yield tables, sample plot-lay-out, measurement, compilation.

## (4) Forest Utilisation

## (a) Paper I (General Utilisation)

Definition and scope; logging problems in various forest types of India, felling and extraction—implements, season of felling and extraction, methods of felling, conversion of timber and fire-wood, methods of extraction and transport, systems of sales, timber depots, timbers of India—description and suitability for various purposes, wood based industries in India and their economics, modern logging tools and techniques and their scope in India.

## (b) Paper II (Forest Products other than timber)

Minor forest produce, its importance and utilisation.

Study of minor forest products, gums, resins, oils, lac, fibres, flosses, tanning materials, katha, canes, medicinal plants, fuel, charcoal, grasses, leaves, flowers, fruits, seeds etc; manufacture of charcoal.

## (5) Geology

## (a) Paper I (Geology Theory)

Earth and its origin, rocks, their kind and origin, minerals as rock components, physical characters of minerals, identification of important minerals, geological structures and their topographical expression, geological agents—volcanoes, springs, earth-quakes, wind, frost, glacial action, rivers and underground water, classification of formations, geological features of India, relationship among geological formations, soils and forest types of India, engineering geology, practical and field studies.

## (b) Paper II (Geology Practical)

- i. Physical character of minerals.
- ii. Important rock forming minerals.
- iii. Igneous rocks.
- iv. Sedimentary rocks.
- v. Metamorphic rocks.
- vi. Introduction to fossils.
- vii. Simple Geological maps.

## (6) Soil Science

## (a) Paper I (Soil Science Theory)

Plants and soil, soil formation processes, physical and chemical properties of soil, organic matter, soil water, soil air, soil temperature, soil profile, soil classification, soil description, soil survey, soil amelioration, study of soil profile in the field.

## (b) Paper II (Soil Science Practical)

Mechanical analysis of soil, moisture loss on ignition, experiments with humus, estimation of total Nitrogen, exchangeable calcium and Magnesium, Organic matter in soils, determination of lime requirements of soil, moisture equivalent of soils, pore space, pH and exchangeable acidity in soils, absorptive power of soils, qualitative tests for sourness of soil, soil profile study.

## (10) Forest Botany

## (a) Paper I (Botany Theory)

General Botany.

Importance in forestry; classification of plant kingdom; morphology of root, leaf, flowers; development of seed and fruits, seed dispersal, study of cell, cell division and tissues, histology of root, stem, leaf of monocots, dicots and gymnosperms.

Physiology; function of protoplasm, nutrition and growth, root absorption, ascent of sap; transpiration, photo synthesis

and photoperiodism, respiration and fermentation, growth and movements, translocation of food materials and storage, parasites, saprophytes insectivorous plants, epiphytes physiology of reproduction.

Plant collection and preservation, field and laboratory work.

(b) *Paper II (Botany Practicals)*

- (i) Dissection, sketching and description of seeds, leaves, stems and inflorescence.
- (ii) Cutting sections, staining, mounting and examining the sections under the microscope.
- (iii) Examination of permanent slides of cells, internal structures, stem roots, leaves etc. for primary and secondary growth.
- (iv) Demonstration in Plant Physiology.

(12) **Forest Zoology and Entomology**

(a) *Paper I (Zoology Theory)*

General Zoology.

Role of animals in Forestry. Morphology, anatomy and life history of common animals and insects under main groups. Examination of animals and insects in the museum, dissection work in the laboratory study of ecology and life history of common animals and insects in the fields.

Systematic Zoology (As applied to wild animals birds and forest insects).

Classification of animals kingdom. Study characters of class mammalia, aves, pisces, reptiles with reference to wild life, study characters of class insects with reference to forest insects.

(b) *Paper II (Zoology Practical)*

- (i) Examination of Amphibia, Reptilia and Apes in the museum,
- (ii) Examination of slides of Micropoda, Protozia, and allied orders,
- (iii) Study of insect anatomy,
- (iv) Dissection of various insect specimens for studying the morphology,
- (v) Classification of insect orders,
- (vi) Excursions and tours to show the method of collection, and ecology of forest insects.

(13) **Forest Engineering**

Building materials—stones, bricks, tiles, mortar, concrete, plaster and painting, timber.

Masonry and its types; carpentry and joinery, floors, roofs, doors and windows, stairs, simple mechanics, strength of materials.

Simple mechanics, load, weight, stresses, etc.

(14) **Forest Surveying**

(a) *Paper I (Survey Theory)*

Objects and scope, scales, maps and map reading, history of map publication in India, classification and nomenclature of maps, measurements of distance—units instruments and methods, different kinds of survey and their plotting—chain and compass survey, plane—table survey topographical survey, levelling—principle instruments and methods, measurements of angles, various instruments, and their uses, computation of area enlargement—reduction and copying of maps, field work and exercises, drawing and lettering.

(b) *Paper II (Survey Practical)*

Practice in lettering, survey by various methods levelling and preparation of plates.

**II — Exercises in the First Year**

(1) **Study and practical work in tours**

(i) *Summer tour*

Study of locality factors, leading to forest vegetation and site quality. Forestry terminology; stem analysis, stump analysis, increment boring, sample plot layout, enumeration; field botany; soil profile and its description.

(ii) *Autumn tour*

Study of soil conservation problem and measures. Watershed—management, farm forestry; ravine reclamation.

(iii) *Winter tour I*

Study of ecological succession, natural and artificial regeneration, tending, mechanizer plantations of fast growing species; yield and volume tables; forest types.

(iv) *Winter tour II*

Natural and artificial regeneration, taungya technique, afforestation techniques in various types of areas, forest types. Forest based industries: cooperative management of forests.

(2) **Botanical collections during each tour**

Collection and submission of complete botanical specimen of not less than 30 plants properly dried, mounted and labeled at the end of the tours mentioned in (1) above.

(4) **Engineering and Surveying Plates**

(i) *Engineering plates*

Brick bonds, foundations; plans, elevations and cross sections of two simple buildings, sketch plans of buildings, bridges, lime kiln etc. made during the tour in a graph note book.

(ii) *Surveying Plates*

Lettering, chain survey, prismatic compass and chain survey, plane table and chain survey, topographic survey.

**III — Written and practical examinations in Second Year**

**Forestry Subjects**

(1) **Silviculture**

(a) *Paper I*

The coverage of the syllabus will be the same as for first year, with a greater emphasis on the forestry practices studied on tours.

(b) *Paper II*

Silviculture of Indian Trees:—Information on 35 important tree species indigenous as well as exotics, including reference, value and utility, growth characteristics occurrence in India, site requirements, phenology, silvicultural characters, natural regeneration methods, artificial regeneration techniques, rate of growth, rotation, exploitable size etc. Silviculture systems—definition and classification, detailed study of clear felling systems, shelter-wood systems, selection systems, accessory and coppice arrangement of felling area, methods of obtaining regeneration, advantages and disadvantages, applicability, application in Europe and India, choice of system, methods of conversion, evaluation of silvicultural systems.

(c) *Viva Voce Examination*

This will cover general Silviculture, Silviculture of Indian Trees, Silviculture systems, etc.

(4) **Forest Utilisation**

(c) *Paper III (Forest Products) (Processed)*

Wood Preservation—Scope, agencies of wood deterioration, wood preservation, treating processes cost and economics, timber yards and their hygiene, protection against fires etc.

Composite Wood—Defects in natural wood, impregnation of wood, adhesives, production of veneer laminated wood, compregnated wood, utilisation of waste etc.

Paper and Cellulose Industries—Fibrous raw material—classification, structural characteristics of important materials essential requirements for suitability for industry, availability chemical and mechanical pulp cost and economics, viscose rayon, recent advances.

Saw-Milling, Wood working and Wood Using Industries.

Types of sawing machines, tools and joints, working properties of Indian timber, suitability of woods for various purposes.

Wood Seasoning—Definition, advantages, wood, water-relationship, methods of storage, stacking of timber, wood defects, seasoning kilns, behaviour of seasoned wood.

(d) *Paper IV (Wood Technology Theory)*

Wood Technology—Scope, structure of wood, general features of wood, defects in wood, identification of 40 most important timbers of India, laboratory studies.



(e) *Paper V (Wood Technology Practical)*

- (i) Identification of 40 common Indian Timbers with a hand lens.
- (ii) Study of some common defects in timber.

(7) **Forest Management**(a) *Paper I (Forest Management, Working Plans and Forest Finance)***Forest Management —**

Definition, principles, objects — Division of Forest — legal, administrative, management and territorial, concept of normal forest, increment, rotation — its definition, nature and types, concept of conversion and conversion period, distribution of age gradations and age classes in regular and irregular forests, felling series, felling cycle, cutting section, periodic block etc.

Site quality, quality classes, reducing factors, relationship of normal growing stock, increment and yield regulation of yield, various methods and their application to Indian Forestry.

**Forest Finance**

Definition, scope, property and concept of value, theory of price and price indices, rate of interest essential formulae.

Estimates of expense and receipts — money tables, methods of calculating the value of forests, market value, cost value, rental value and expectation value, Faustmann's formula for soil expectation value.

Methods of estimating financial results in forestry — economics of plantation and tending, financial rotation, definition, method and application.

**Assessment of damages.**

Comparative economic of different modes of utilisation — agriculture and forestry, choice of species, silvicultural systems, methods of treatment rotation, etc.

**Financial test of forests management.****Working Plan —**

Definition, object, scope.

Preparation of working plan — preliminary working plan report, field work — stock mapping, compartment description, collection of statistical data.

Office work — collection of data for Part I, writing of Part II.

**Control of Working Plan.**(b) *Paper II (Forest Protection)*

General Protection — Agencies causing damage — the description and extent of damage, preventive and protective measures, fire, grazing, illicit cutting and lopping, wild animals, birds etc. climatic agencies, fire protection — causes of fire, control measures, fire lines, fire watchers etc. grazing its control — grazing incidence, rotational and controlled grazing, fencing against grazing, and wild animals, damage done by man, damage done by wild animals, damage done by injurious plants, weeds, climbers, parasites etc. their control protective measures against climatic injuries.

(8) **Wild Life Management**

Scope — importance, conservation concept, biology and ecology, census, classification, distribution and description of wild life in India, principles of wild life management, special features of management of carnivora, bear, deer, antelopes, small game and rare species, game preservation and wild life legislation, management of sanctuaries, parks, weapons and shooting rules, publicity and education, wild life photography.

(9) **Forest Policy and Law**

Forest Policy — concept, scope, necessity, foundations of a stable forest policy, contents of the national forest policy, Indian Forest Policies of 1894 and 1952, forest policies of some foreign countries.

Forest Law — legal definitions, application of Indian Penal Code to forest, principles of criminal law and punishment, criminal procedure code, law of evidence, objects of special forest law, detailed study of Indian Forest Act, legal organisation of forest service.

(10) **Forest Botany**(a) *Paper I (Botany Theory)***Systematic Botany.**

Heredity and evolution, classification of plants and various systems, genetics — importance in forestry, plant introduction.

Based on Benthem and Hooker, systematic studies of 52 important families of forest plants.

Laboratory studies and field studies, plant collection and preservation.

(b) *Paper II (Botany Practical)*

Dissection, sketching, description and identification (with flora) of various families of flowering plants including grasses.

(11) **Mycology and Forest Pathology**(a) *Paper I (Mycology Theory)*

Forest Pathology — Morphology and physiology of fungi, damage caused by fungi in timber, fungal diseases of important tree species their pathology and control.

General principles of controlling pathological diseases in forest, protection of forests and marketing of forest products.

(b) *Paper II (Mycology Practical)*

(i) Examination of mycelium of mucor, or rhizopus and study the asexual reproduction of the fungus.

(ii) Study of fruiting structures of escomycetes and basidiomycetes.

(iii) Examination of sporophores in basidiomycetes.

(iv) Study of the types of decay in timber.

(v) Study of rust diseases of conifers.

(12) **Forest Zoology and Entomology**(c) *Paper III (Forest Entomology Theory)*

Forest Entomology — Role of insects in forestry. Ecology of forest insects, classification of injurious forest insects in relation to food habits. Important pests of major tree species, felled timber, seeds, nurseries and plantations. Beneficial insects — predators and parasites.

Principles of insect control in forestry. Insect collection and preservation.

(d) *Paper IV (Forest Entomology Practical)*

Sketching, description and identification of injurious and beneficial insects, pests of major tree species and nature of damage caused by them.

(13) **Forest Engineering**

Buildings — selection of site, lay-out, estimate of construction of chimneys, lightening conductors, R. C. C. retaining walls and breast walls.

Bridges — types, terminology, designs, estimate and constructions.

Roads — types, terminology used in road engineering, alignment, construction and estimates.

Water supply — wells etc.

Field engineering — hauling of timber, transport structure — forest tramways, river training works.

Drawing and draftsmanship — plan, elevation section etc.

Field exercise in road alignment, practical field engineering course at Rorkee, studies on tour.

Simple mechanics, stresses, bending movement, shear force etc.

**IV — Exercises in the Second Year**(1) **Study and practical work in tours**(i) *Summer tour*

Study of Working Plans and management of conifers and temperate broad leaved species; introduction of exotics, mechanised logging; watershed management planning and practice.

(ii) *Winter tour*

Study of working plans and management of teak, bamboo, deciduous species, ever-green species: thinning research; utilisation methods including visits to wood based industries, industrial planning and correlated industrial plantations.

(2) **Botanical collections during each tour**

Collection and submission of complete botanical specimens of not less than 30 plants properly dried, mounted and labelled at the end of the tours mentioned in (1) above.

(3) **Entomological collections during the course**

Collection, preservation and labelling in a systematic manner of at least 50 important insect specimens covering as

many families as possible during the tours and at headquarters. Maintenance of field observation note book on the collection.

(4) **Engineering and Survey Plates**

*Engineering plates*

Stress diagrams, timber beams, roof trusses, timber bridges, sketch plans of buildings bridges, lime kiln etc. made during the tours in a graph note book.

(5) **Working Plan exercise**

Preparation of a working plan and management map for not less than 1000 ha. of forest. Collection of field data, stock mapping, enumerations etc. in the forest.

(6) **Field Engineering course with the Army**

Practical uses of materials used in construction of buildings, bridges and roads and lifting of heavy weight. Simple mechanical methods used in movement of forest produce, maintenance of vehicles and water-man-ship. Usage of explosives.

(7) **Forest Road Alignment exercise**

Alignment, mapping and estimation of forest motor road through a hilly country.

(8) **Dissertation (thesis)**

One a selected approved topic of forestry a detailed paper reviewing the available literature and recorded observations and personal observations during the tours, synthesising and analysing the information in a critical manner, under the directions of a guide.

**Part II**

**Qualifying Tests**

- (i) *First Aid and Ambulance Drill* — The probationers will be trained and tested in Civil Defence, First Aid and St. John's Ambulance Drill.
- (ii) *Weapon Training* — The probationers will be trained and tested in the use of short-guns, rifles, pistols and revolvers.
- (iii) *Riding* — Will include the walk, trot, canter gallop and jumps (small fences and ditches).
- (iv) *Regional languages* — The test will comprise translation, free composition, set composition, conversation and dictation. The probationers knowledge of grammar will be tested chiefly by composition, conversation and by passages for comment.

(v) *Hindi* — The test will comprise translation, free composition, set composition, conversation and dictation. The probationers knowledge of grammar will be tested chiefly by composition, conversation and by passages for comment.

(vi) *Motor Mechanics* — Will include maintenance of motor vehicles and elementary knowledge of their working.

(vii) *Swimming* — The standard of training and proficiency will be determined by the President.

**SECOND SCHEDULE**

[See regulation 5(2)]

| State             | Regional Languages                      |
|-------------------|---|
| Andhra Pradesh    | Telugu or Urdu                          |
| Assam             | Assamese or Bengali                     |
| Bihar             | Hindi                                   |
| Gujarat           | Gujarati                                |
| Haryana           | Hindi                                   |
| Jammu & Kashmi    | Urdu, Kasmiri or Dogri                  |
| Kerala            | Malayalam                               |
| Madhya Pradesh    | Hindi                                   |
| Madras            | Tamil                                   |
| Maharashtra       | Marathi                                 |
| Mysore            | Kannada                                 |
| Nagaland          | English                                 |
| Orissa            | Oriya, Telugu or Bengali                |
| Punjab            | Hindi or Punjabi (in Gurumukhi script). |
| Rajasthan         | Hindi                                   |
| Uttar Pradesh     | Hindi                                   |
| West Bengal       | Bengali or Hindi                        |
| Union Territories | Hindi, Bengali, Marathi and Manipuri.   |

**Mormugao Port Trust**

**Corrigendum**

The no. of the notification issued by the Mormugao Port Trust and published at pg. 728 of the Govt. Gazette, Series I, no. 44, dated 30th January 1969, should be read as «MPT/IGA (E.344)/68», instead of «MPT/IGA (E.334)/68».